covered an area of about 2 cm.^{2}.) The dried chromatogram was treated with a 20 per cent solution of antimony trichloride A.R. in dry, alcohol-free chloroform, and the paper was heated for 3–5 min. at approximately 70° C.

The colours produced are shown in the accompanying table.

On heating, the colour due to gitoxigenin appears first, followed by digitoxin, gitoxin and lastly digitoxigenin, which is also least sensitive to the test. Work in progress indicates that the reagent may be used successfully for the detection of strophanthus glycosides.

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Pharmacological and Toxicological Actions of Dart Poison used in Malaya

PHARMACOLOGICAL and toxicological actions of dart poison have received a great deal of attention in the past. Among the contributors on this subject were Ridley[1], Chopra and de Premankur[2] and Doebel *et al.*[3]. It was generally assumed that the chief toxic agent in the dart was the digitalis-like substance contained in the latex of the Upas tree *Antiarias toxicaria*, with which some dart poison was known to be made (Burkill[4], and Chen *et al.*[5]). The present communication puts on record some observations of the pharmacological and toxicological actions of a dart poison obtained recently from the Sakais in Perak, North Malaya. A water extract of the dart poison was prepared by dissolving the poison of one dart in 1 c.c. of water. It was filtered before use for the experiment.

The results obtained showed that the dart poison had no stimulating activity on the isolated guinea pig's ileum. It exerted, however, a strong inhibitory effect on the stimulating action produced by histamine and acetylcholine in the same ileum. In the perfused toad's heart, it had a stimulating effect when given in lower concentration and an inhibiting effect when given in higher concentration. Such effects indicated that the dart poison possibly contained two different substances affecting the toad's heart in opposite directions. In higher concentration, it caused stoppage of cardiac action in diastolic relaxation. This was different, therefore, from the effect produced by higher concentrations of digitalis, which usually results in systolic arrest of the heart. The dart poison lowered the blood pressure and increased both the depth and rate of respiration in cats under 'Dial' anæsthesia. This cardiac inhibitory effect on toad's heart and the lowering of cat's blood pressure were not influenced by atropine, thus showing that the active substance which caused these effects was not a choline ester. It was not thought that the dart poison possessed any antihistamine or atropine-like activity, because its inhibitory effect on histamine and acetylcholine stimulation of the guinea pig's ileum lacked specificity. The dart poison also had some curare-like activity, because it inhibited the contractions of isolated rat's diaphragm elicited by stimulating the phrenic nerve. It was estimated, however, that this activity was weak, because each dart contained the equivalent of only 200 μgm. of *d*-tubocurarine, which is not a toxic dose in small animals.

Toxicological observations made on toads, rats and cats all showed the symptoms of increased respiration followed soon by asphyxia and death. It was concluded that respiratory paralysis was the most likely cause of the fatal results produced by the poison darts in animal hunting. Since it is improbable that one substance should have all the actions listed above, it seems right to conclude further that the dart poison contained more than one pharmacologically active substance and that it had been prepared from several sources of material. The fact, moreover, that the main symptoms were very similar to those produced by strychnine suggested that the chief toxic substance was obtained from a plant belonging to the *Strychnos* group, rather than from the latex of *Antiarias toxicaria*.

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Changes in the Distribution of the Intertidal Barnacles in Relation to the Environment

IN previous communications[1,2] the possibility that changes may occur in the distribution of intertidal organisms over a number of years was discussed, and the established distribution of *Chthamalus stellatus* was extended to include much of the Irish Sea coastline. Further new evidence has come to light showing that while this barnacle may have increased its range and abundance over recent years, it was nevertheless present in the Isle of Man in 1933. A photograph taken by H. B. Moore in March 1933 shows a single individual which appears on close inspection to be *Chthamalus*; moreover, statistical tests based on the size and form of the aperture and the angle of the scutotergal margin show that this must be *Chthamalus* and not *Balanus balanoides*.

However, critical observations on *Balanus balanoides* and *Chthamalus stellatus* during recent years have shown a marked change in their distribution, indicating a general recession of *Balanus* from its southern and western limits, and a corresponding increase in *Chthamalus*. Conclusive evidence for this was first obtained by one of us (A. J. S.) by comparison of recent ecological findings for the Plymouth area with those of Moore[3]. This was confirmed and substantiated by records in the Brixham area (D. J. C.), Barnstaple[4] and Isle of Man (A. J. S.). Since the organisms studied are sessile ones, the changes observed are real changes in the population and the possibility of changes due to migration is eliminated. Most of the regions from which *B. balanoides* is disappearing are those where *Chthamalus* is extremely abundant. However, exclusion by direct competition